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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/516,638 | 12/02/2004 | Kosaku Hirota | 14633.SUSWO | 4569 |

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EXAMINER

ZUCKER, PAUL A

ART UNIT PAPER NUMBER

1621

DATE MAILED: 12/05/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/516,638

Applicant(s)

HIROTA ET AL.

Examiner

Paul A. Zucker

Art Unit

1621

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-7 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date <u>12/2/2004</u> . | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

1. Claims 1-7 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 1 recites the limitation "deuteration of a hydrogen atom". The Hydrogen atom does not become deuterated but, rather, the compound to which it is attached. Claim 1 and its dependents are therefore rendered indefinite and unclear.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35

U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

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2. Claims 1, 2, 4 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hirota et al (Bulletin of the Chemical Society of Japan, Differences in the Catalytic Activity of Nickel, Platinum and Palladium as Observed in the Isotopic Exchange Reaction of Paraxylene with Deuterium Oxide, 1962, 35, pages 228-232) in view of Rylander (Hydrogenation Methods, 985, Academic Press, Inc., Orlando, Florida, page 4).

Instantly claimed is a process for deuteration of an alkyl-substituted aromatic compound in a deuterated solvent under reflux in a sealed tube in the presence of an activated palladium on carbon catalyst.

Hirota teaches (Page 230, column 1, 2nd full paragraph) a process for deuteration of *p*-xylene in deuterium oxide as a deuterated solvent under reflux in a sealed tube in the presence of a catalyst. Hirota teaches (Page 230, columns 1 and 2, top, entries 10-12) the use of palladium black (an unsupported catalyst) as catalyst.

The difference between the instantly claimed process and that taught by Hirota is that the use of a palladium on activated carbon is claimed while an unsupported platinum black catalyst is taught by Hirota.

Rylander, however, teaches (Page 4, 1st full paragraph) that noble metals are rarely used in unsupported form for any purpose other than laboratory preparations since supported catalysts are more efficient on a weight of metal basis and result in

improved recovery. Rylander further teaches (Page 4, 3rd full paragraph) that activated carbons are suitable supports.

Thus one of ordinary skill in the art would have been motivated to modify the process of Hirota in order to produce an effective industrial procedure. Based upon the teaching of Rylander there would have been a reasonable expectation for success.

Claim Objections

3. Claim 1 is objected to because of the following informalities: The word --a-- should be inserted before the word "benzyl" on line 2. Appropriate correction is required.
4. Claims 3, 5 and 6 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

Allowable Subject Matter

5. Claims 3, 5 and 6 are drawn to allowable subject matter. The following is a statement of reasons for the indication of allowable subject matter: The closest prior art, Hirota et al (Bulletin of the Chemical Society of Japan, Differences in the Catalytic Activity of Nickel, Platinum and Palladium as Observed in the Isotopic Exchange Reaction of Paraxylene with Deuterium Oxide, 1962, 35, pages 228-232), neither discloses nor fairly suggests that his conditions may be used on compounds having aromatic alkyl substitution levels higher than methyl. The instantly claimed process is therefore patentable over Hirota, the closest prior art.

Examiner's Suggestion

6. For purposes of clarity, the Examiner suggests that Applicants consider rewording the claims while remaining careful not to introduce new matter.


Conclusion

7. Claims 1-7 are pending. Claims 1-7 are rejected.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Paul A. Zucker whose telephone number is 571-272-0650. The examiner can normally be reached on Monday-Friday 5:30-2:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Johann R. Richter can be reached on 571-272-0646. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


PAUL A. ZUCKER, PH.D.
PRIMARY EXAMINER